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"DO ANTI-RETROVIRAL TREATMENTS ENCOURAGE INDIVIDUALS TO GET TESTED FOR HIV/AIDS IN SUB-SAHARAN AFRICA?"

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Abstract

In many Sub-Saharan African countries, governments and international aid agencies have made progress towards a universal antiretroviral treatment coverage. However, a great proportion of HIV infected individuals is not aware of its HIV status and do not take advantage of the benefits from knowing their status. This project aims to analyze the impact of a country antiretroviral treatment coverage on the individuals` decision to get tested for HIV, and thus on their demand for knowing their HIV status. I find a positive relation between individual decision to get tested and antiretroviral treatment, suggesting that individuals are more likely to perform the HIV test where antiretroviral treatment is widely available.

Keywords: HIV/AIDS, antiretroviral therapy, testing behavior.

1. Introduction and the Project purpose

In 2009, 2.6 million people were estimated to be newly infected with HIV/AIDS, 1.8 million were Sub-Saharan Africans. The HIV/AIDS epidemic is particularly alarming in the Sub-Saharan African countries, where there are insufficient health-care services and lower epidemic capacity response. In this context, considerable policy efforts have been made through the funding and implementation of HIV/AIDS programs, focused on infection prevention and treatment. But the discouraging "newly infected rates" suggests that the outcome of prevention strategies have failed to reach their expected impact. Among the various prevention strategies, the uptake of routine HIV testing and the consequent awareness of an HIV status prevails as the most important, to individuals exposed to risky behaviors. Although the test is frequently free and generally available in health centers, there still exists psychosocial, informational, and logistical barriers that prevent individuals from getting tested. The individual awareness of HIV status plays a crucial role in the response to the epidemic for two reasons. First, unaware HIV positive individuals might involuntarily transmit the virus to partners. Secondly, getting tested is the first step for those who are infected to access primary prevention care, HIV related illness care, psychosocial support, mother to child transmission prevention care and ultimately access HIV treatment. Since the mid 1990s, the Antiretroviral Treatment (ART) have become gradually available in developing countries, after the scientific confirmation of its benefits: it improves infected individuals physical well being, permits them to live longer and is highly effective in preventing mother to child HIV transmission. In a world where these drugs are extremely expensive, a universal ART coverage[1] has been the prevailing health policy on the HIV/AIDS

[1] "Antiretroviral therapy coverage measures the proportion of people on antiretroviral therapy, as reported by national programmes, in relation to the estimated number of people in need of antiretroviral therapy." (WHO, 2010)

fight in last decade. Although the importance of ART policies, is unquestionable, the programs towards the prevention to incentivize individuals to know their HIV status should continue to be made, since testing for HIV is the starting point for treating infected individuals. Some literature suggests that among the several reasons that prevent individuals from getting tested, the absence of treatment or cure is a crucial one. Furthermore, other studies anticipate that if ART is available in the health centers and if individuals perceive the possibility of being treated in the case of an HIV positive result, they would be more likely to perform the HIV test and know their HIV status. The present project intends to contribute to a better understanding, through an empirical analysis, of the association between the ART access and the individual decision to get tested. In particular, the study aims to analyze the socio-demographic factors that determine the individual decision to get tested and know the result. Additionally, the project emphasizes the association between the ART availability in a country with the individual concernment to test and know the HIV status. The target group considered in this analysis is adults of both genders, ages among 15 to 49, that might manifest different HIV risky exposures. In the Sub-Saharan African region, countries with approximated HIV prevalence rates but simultaneous with different levels of ART coverage were chosen: Namibia, Zambia and Zimbabwe. The next section presents the major findings of some previous literature on this field. Then, the data and methodology of this project are explained in the following sections, as well as the empirical model. Finally, in the last section, the results are explained and conclusions are made.

2. Literature Review

In the last decade, testing facilities and advertisement campaigns have been increasingly available in Sub-Saharan African countries, in order to encourage individuals to know their HIV status as well as initiate treatment if necessary. An important purpose of those campaigns

is the individuals` awareness to perform the test regularly and voluntary. But sometimes these desired outcomes have ambiguous impacts due to several economic and social constraints. Sherr *et al.* (2006) defended the idea that in developing countries, aspects such the existence of stigma and discrimination, unavailability of social support, deficient prevention of infant infection in pregnancy and absence of anti-retroviral treatment might discourage individuals` willingness to perform the HIV test. Aside from the personal motivation, the mechanism by which Voluntary Counseling and Testing (VCT)[2] is provided may also be important. Performing the test at home, in the workplace, or at other convenient location facilitate acceptability and uptake. The importance of ART availability as a factor on the testing decision, was mentioned by Sweat *et al*. (2000) when anticipated that "wider ART availability could swing the balance in favor of greater uptake of VCT services". Moreover, Gupta and Sankar (2002) pointed out that "it has been argued that provision of ART can reinforce effective prevention programs, stimulate voluntary testing and counseling and help to reduce stigma". The literature has empirically explained the factors that determine the demand for testing, however, few studies consider the availability of ART as one of those factors. Rajaraman and Heymann (2007) analyzed the determinants of test uptake considering the HIV testing distribution in 2002 and 2004 in Botswana, a high HIV prevalence country. Bi-variate analyses and binomial multiple logistic were conducted to establish correlates of testing within the study population. They concluded that being a women, younger, higher educated, better paid, had become parents, had known or even provided care to someone with HIV positive status and being aware of an HIV policy at their workplace are all indicators of higher likelihood to have taken the test. Sherr *et al.* (2006) examined the determinants of uptake VCT services. They followed a population-based cohort study of adults in Manicaland,

[2] Voluntary Counseling and Testing is commonly used is the literature referring to a session of around 15 minutes whereby individuals take the test, have a brief counseling focused on the infection (HIV), the disease (AIDS), risk behavior awareness and finally the result is known.

province of Zimbabwe, whose demographic, socioeconomic, sexual behavior, and VCT utilization data were collected at baseline (1998 – 2000) and follow up (3 years later). They found an increase of VCT in 5 percent at follow up, and concluded that age, education and knowledge of HIV were associated with VCT uptakes. Note that the authors refer that this study was conducted when ART was not available in Zimbabwe. They predicted that "the advent and expansion of ART may dramatically affect such motivation and cause a shift in normative attitudes since personal gain and treatment access are likely to have a dramatic effect on uptake of VCT". This assumption was firstly studied in a population representative sample by Day *et al*. (2003). The study aimed to identify attitudes that influence uptake of VCT, including the hypothetical availability of ART. A survey was administrated within the sample of mineworkers in South Africa. Some aspects were pointed out as barriers to VCT: fear of an HIV positive result and the potential consequences as stigmatization, disease and death. Moreover, half of the sample argued that some features should be improved, such as the workplace education programs and confidentiality. The findings show that only 14% indicated higher likelihood to VCT if ART was available. They also concluded that a vigorous community education program is essential if the introduction of ART is to be effective in promoting uptake of VCT. At last, a study from Glick (2005) argued that the demand for testing uptake would depend on the criteria used for determining who is eligible for treatment, in a context where the scarce ART is primordially attributed to those individuals in an advance stage of HIV/AIDS and likely to present HIV/AIDS related symptoms. He predicts at that time that the ART availability would only decrease the cost of testing for a person who developed symptomatic AIDS illness. So far, the literature has empirically determined the influence of several factors on the likelihood to get tested.

However, there is not any empirical study based on a country representative sample examining the relationship between the decision to get tested and ART coverage.

3. Data

3.1 Data source and socio demographic characteristics

The present project uses data from the Demographic and Health Surveys (DHS) program. DHS collects, analyzes and disseminates accurate and representative data on population, health and HIV among several countries. Though some differences exist among countries on its structural characteristics as well as health and HIV patterns, the DHS surveys are transversal to all countries, which permit a feasible generalization of the data and enables the cross country comparison. These surveys are performed within an average period of 4 years, and even amongst the most recent surveys, not all of them include HIV related questions. Moreover, considering that the significant spread of ART in African countries occurred around 2004, the analysis was limited to the data available on the DHS starting from this year, in order to include the impacts of ART availability. Additionally, the chosen counties should present similar HIV prevalence but a relative different ART coverage, in order to perform a feasible cross country comparison of different levels of ART. All these previous criteria, had strong implications in the choice of the countries to be included in this project: Namibia (2006/2007), Zambia (2007) and Zimbabwe (2005/2006). The data is a representative randomly selected sample of the population, collected in all the regions of each of the three countries, including males and females from age 15-49. The Demographic and Health Surveys were implemented by the Ministry of Health and Social Services (in association with other entities) in Namibia and by the Central Statistical Offices in partnership with other public institutions in Zambia and Zimbabwe. Table A presents the sample distribution of the 43.447 interviewed individuals, according to gender and country. In addition, the sample main

socio demographic characteristics are described in table B according to both genders. Note that all the tables in this project distinguish males and females, since their individual and social characteristics can differently influence their HIV related behaviors and decisions.

3.2 HIV related characteristics

In most African countries, HIV/AIDS widespread information to citizens is well developed. Although the effectiveness of these advertisement campaigns, the effective awareness of individuals regarding HIV/AIDS is still a questionable issue. In light of this, it is worth analyzing the figures on HIV related questions based on the sample collected and presented in table C. It demonstrates that knowledge of HIV/AIDS is nearly universal in the three countries, where around 99 percent of women and men have heard of HIV or AIDS. However, few people have been tested. Barely half of the sample according to gender and country had been tested and are unaware of their HIV/AIDS status. Comparatively, for both genders, Namibia presents the highest rate of uptake, followed by Zambia and then Zimbabwe. In addition, for all countries, women present a higher testing rate, which is consistent with the fact that maternity exposes them more often to medical services and HIV awareness. Finally, several reasons may drive individuals to test and know the HIV status. According to the information regarding the last test performed, all the groups present higher proportion of individuals that voluntary asked the test, with the exception for women in Zimbabwe. Namibia has the highest rate of voluntary tests for both genders, followed by Zambia and then Zimbabwe. These findings are consistent with the ones regarding the last test performed, where the countries can be ranked from the most prevalence of voluntary test uptake to the least: Namibia, Zambia and Zimbabwe.

4. Methodology

The HIV test can be taken under various circumstances, and driven by an individual voluntary decision. When the test uptake is increased with counseling from an expert, is known in the literature as Voluntary Counseling and Testing. In this project, due to the DHS data design, no relevance is given if individuals where counseled or not, the analysis focuses on individuals that have been tested, independently of the forces that drove them. The dependent variable in focus "Tested" is a dummy variable that takes 1 for a positive result and 0 otherwise. Also, the result 1 "had tested" should meet certain requirements, in order to appropriately reflect the individuals propensity of testing when the ART is available. First, the positive outcome captures all the individuals that have been tested, but only in the last 12 months, in order to harmonize the timing of when the test was performed and the respective ART coverage of each country displayed in that specific year. Secondly, among those individuals that had performed the test in the last 12 months, the ones considered for the positive outcome are the ones that voluntary asked for testing. Finally, the positive outcome accounts for individuals that asked for the test in the last 12 months, and posterior got the test result. Those three conditions are necessary to accurately measure the willingness of an individual to be aware of its HIV status, and consequently access to the ART. Table D presents the sample distribution according these criteria.[3] The independent variable of interest respecting ART was defined on accordance of the available data. The variable look for capture the availability of the antiretroviral treatment to individuals when occurs the decision to get test and know a result. Idealistically, the individual answer to the question "Were you eligible to be under ART when you performed the last test?" would be the appropriate measure to get the individual affordability and availability of ART. Derived from data constraints on ART, two proxy

[3] Note that, from a sample of 43.447 individuals, only 10.633 are considered to the empirical analysis. There are throughout the sample several missing values, as exposed in the table D. A possible explanation for the plenty missing values would regard the own structure of the questionnaire, if these test related questions were jumped due a determined answer of a previous question. The questionnaire was revised but no explanatory reason was found to the missing values.

variables were chosen. The first variable concerns the country level of ART coverage. ART coverage is expanding in African countries, but it barely reaches all of the population in need of the treatment. Assuming this, the countries with relatively similar HIV prevalence but with different levels of ART coverage were chosen: Namibia (2006) with 71 percent of ART coverage, Zambia (2006) with 35 percent and finally Zimbabwe (2005) with 8 percent[4]. The second ART proxy variable is measured at the region (rather than country) level and is based on a question from the surveys, "Have you heard of drugs to help infected people to live longer", presented in the table C. The variable was constructed through the proportions of individuals that had answered "yes" by the total number of individuals inquired, for a given region of a country. A large proportion of "yes" is likely to be related with a high ART availability in that region. The construction of this variable permits regional variations of the ART availability within a country as well as cross-country comparison. Note that the answer "don't know" was considered as a missing value, since its proportion on the total sample was significantly low. Then, two regressions were constructed on agreement of both ART related variables.

5. The empirical model: determinants of HIV voluntary testing

5.1 ART coverage at the country level

The empirical analysis purpose is to measure the impact of the several determinants of testing uptake, and in particular, analyze the impact of ART availability or access. The dependent variable "Tested" was regressed by a logistic function on several determinants. Those included both individual socio-demographic characteristic variables and aggregate country specifications. The model was regressed according to genders since their individual and social

[4] Source: WHO "Progress Report" 2007. (Namibia and Zambia).
UNAIDS "Report on the Global Aids Epidemic" 2006. (Zimbabwe)

characteristics can influence differently in terms of HIV related behaviors and decisions. The model takes the following form using a logit model:

$$Tested = \beta_0 + \beta_1 age + \beta_2 wealth + \beta_3 religion + \beta_4 urban + \beta_5 education + \beta_6 married + \beta_7 work + \beta_8 earnings + \beta_9 know\ someone + \beta_{10} ART\ coverage + \beta_{11} GDPpc + \varepsilon i$$

Age is a variable constructed, with the categories distributed uniformly across three groups of age ranges: (15/29=1) (30/44=2) (45/59=3), where the first is the omitted group. The wealth index of individuals is directly constructed by DHS and assumes five categories: poorest, poorer, middle, richer and richest. Several and distinctive religions and beliefs are found on each of countries, preventing the overall measurement of all the religions impacts on the testing decision. As so, religion is a constructed categorical variable that can compare common religions across the three countries. The omitted category takes the value of 0 for individuals that have not religion, and other categories are Catholic, Protestant, Muslim and other. The importance of living in urban or rural areas is capture by the urban dummy variable that takes the value of 0 for urban (omitted) outcome and 1 for rural area. The education level is measured through a categorical variable: no education, primary, secondary and higher education. Being married considers not only married individuals, but also, those that reported living together with a partner. This dummy variable takes the value of 1 for married status, and 0 for never married, widowed, divorced or not living together individuals. Work variable takes the value of 1 if the individual worked in the last 12 months (respected to the date of the questionnaire) and 0 otherwise. It considers all individuals that had been employed in last 12 months, independently if they were employed or not at the time of the interview, and if they were on leave. The individual`s earnings are captured through a dummy variable considered as 0 if individual is not paid at all, and numerically categorized if paid only in cash, in cash

and kind, or in kind only. The variable "knows someone" refers to the individual answer to "Do you know anyone who has or died with HIV?", with "yes" and "no" as the possible outcomes. Finally, aggregate country variables are included in the model. The first is the GDP per capita[5] of the three countries: 2193 in Namibia (2006), 366 in Zambia(2006) and 536 in Zimbabwe(2005). Note that these years respect the time of surveys realization. The second is the ART coverage, detailed in the "methodology" section, being the ART related variable included in this model.

5.2 ART regional level variable

Again, the dependent variable "Tested" was regressed using a logit model on individual socio-demographic characteristics variables separately by gender, but with the difference that instead of the inclusion of country aggregate specifications, a regional ART related variable and a country dummy variable were added.

$$Tested = \beta_0 + \beta_1\, age + \beta_2\, wealth + \beta_3\, religion + \beta_4\, urban + \beta_5\, education + \beta_6\, married + \beta_7\, work + \beta_8\, earnings + \beta_9\, know\ someone + \beta_{10}\, Proportion\ heard\ drugs_{region} + \beta_{11}\, country + \varepsilon i$$

All the socio-demographic variables present the same configuration as the previous model, already detailed in the section 5.1. The variable "Proportion heard $drugs_{region}$" works as the proxy for ART availability in a country and captures variation of different levels for ART within a country. At last, in order to compare the different impacts on test uptake in the three countries, a country dummy variable is included, where Zimbabwe is the omitted variable, since it presents the lowest ART coverage level. In this model, GDP per capita could not be included since it would generate colinearity problems in the estimation.

[5] Real Per Capita GDP (U.S. dollars, at 2000 prices, using 2000 exchange rates). Source: IMF.

6. Results

In this section the determinants for the decision to get tested for HIV are discussed. The regression results for both regressions are presented in the table E, performed according to gender. All the variable results presented were associated with tested variables at the 90% confidence level.

6.1 Determinants of Testing (equation A)

Analyzing the results in respect to equation A, we can observe that, a positive relationship is found between the aggregate level of ART coverage and a person´s awareness of their HIV status, although these findings being much more statistically significant for males than females. For both genders, older individuals are less likely to look for HIV status awareness, comparing with the omitted group with ages 15 to 29. This impact is even larger for women and for the older group (45/59) comparing with the group from 30 to 44. At a lower significance level but still being relevant, the wealth index shows that starting from the poorest wealth index, women with poorer and middle wealth index have a higher propensity to learn their HIV status. Being Catholic and Protestant improves the chances of men to perform the test. Contrarily, and for women only, living in rural areas decreases their probability to perform the test when compared to urban areas. Having higher education reveals a higher likelihood to test for women. Being married or living together for both genders reduces the probability to get tested. Women that have earnings in cash have less propensity to get tested, similarly, men with earnings in cash and in kind reduce the chances to get tested. When individuals know someone who has contracted or died from HIV, they are more likely to get tested. Although it has a small impact, higher GDP per capita is related with less likelihood to get tested, for men only.

6.2 Determinants of Testing (equation B)

The second regression while keeping all the socio-demographic specifications, differs from the first by the inclusion of an ART related variable based on individual statements and by permitting a cross-country comparison on the HIV test. The focus variable "Proportion heard $drugs_{region}$" is strongly statistically significant for women, and presents a positive sign for both genders. It shows that the higher the proportion of individuals that have heard about drugs that help infected individuals live longer, the more likely they will get tested, in 58,48 percent for women and in 22,81 percent for men. The significance levels of the results as well as the signs of the coefficients are similar with the first equation, for almost all socio-demographic variables, but the impacts are slightly lower (less than 1 decimal) than the previous equation. On the contrary, some variables present higher impacts on the second regression. This is the case for the age of women, medium wealth for women, and earnings in cash and in kind for men. Finally, the results for the country variables are presented. Living in Namibia increases the probability to get tested in 15,6 percent comparing with Zimbabwe, for male only. No significant impact was found for women living in Namibia. Living in Zambia increases the likelihood to get tested in 13,58 percent for men, and contrarily for women, these decrease the probability to get tested in 9,8 percent when comparing with Zimbabwe.

7. Discussion

In the Sub-Saharan African region context, the three analyzed countries face an enormous generalized HIV epidemic level, and subsequent strategies on prevention of new infection cases and treatment of infected individuals. It is important to understand the factors that determine the testing uptake in order to orientate those strategies of testing awareness to those targets groups that present low awareness of the importance to get tested. Additionally, the

ART provision should ensure that not only could treat individuals as also can incentivize individuals to be more guardians of an HIV negative status while testing periodically prevent infect the others. In Namibia, Zambia and Zimbabwe, the test facilities are mostly available to individuals that can perform the test freely. As some studies had conceptually predicted, the ART aggregate variable in the first equation is positively related with testing for both genders, although the small impact. The same relation is found for the ART related variable in the second equation. Two considerations should be made regarding these two proxy variables findings. First, the ART variables impact is much larger for the constructed ART regional variable than the ART country level variable. Second, the impact levels across genders are opposed: the ART aggregate variable shows a stronger impact for men than women and the ART regional variable demonstrate a larger impact for women. The higher likelihood of younger individuals to test can be explained by the increasingly massive advertisement on HIV subject since the early 90`s. At the time the surveys were performed, youth had already grown learning the HIV epidemic features, so they are likely to be more familiar with the HIV subject and more aware of the importance of know ones HIV status. The higher likelihood to test of poor or medium wealth individuals can be explained by the fact that a person that gets ill, could suspect to have an AIDS related illness, thereby it can have a particular concern in performing the HIV test. One effective approach of disseminating HIV related issues to the populations in African countries is based on priests or religious leader's advice. In this context, Catholic and Protestant men demonstrate more willingness to get tested comparing with men without religious beliefs. Belonging to any religion is not significant to women meaning that other factors might influence largely their decision to test. Living in rural or urban areas differentiate women´s decision to test which can be explained by the inferior rural development in several dimensions, since education until transportation and infrastructure

facilities. Previous literature predict that more educated individuals would demonstrate higher propensity to test, since education would not only expose them more often to the HIV theme but also because more educated individuals could understand and process more effectively health related information. The higher propensity of higher educated women to test is consistent with this, although primary and secondary education have no effects for both gender. The results for the marital status are consistent with the predicted idea that individuals married or living together are expected to be less exposed to risk, thereby revealing less propensity to test. A previous study[6] revealed a strong positive association between monthly income and HIV testing in Botswana, a high HIV/AIDS prevalence country. The results of the present project regarding earnings demonstrate the opposite relation. No plausible explanation for this negative relation was found. Knowing someone who has HIV or died from HIV demonstrated a strong relation with the willingness to test. It can be explained in the sense that knowing someone with HIV might make a person aware of its existence and the dangerous of the infection, encouraging the knowledge of their own HIV status. The unexpected negative relation between GDP per capita and testing behavior has no concrete explanation, although the impact level is extremely low. At last the differences across countries are not uniform for genders. Men living in Zambia or Namibia demonstrate higher awareness of an HIV status. Regarding women, the results are not as conclusive. No statistic significant relation was found for women living in Namibia. However, the findings demonstrate that women living in Zambia have less of a propensity to voluntary test compare with Zimbabwe.

8. Conclusion and policy recommendation

[6] Rajaraman, D. and Heymann, s. (2007) "The social determinants of HIV testing in Botswana: a keystone for addressing the epidemic".

In the considered countries, testing has been increasingly supplied by the national-health services, where testing facilities are free and relatively widespread, as well as increasingly demanded by the more and more informed individuals. However, there are persisting socio-demographic barriers to testing performance, while other factors promote testing. Elder women, married, living in rural areas, and with earnings in cash reveal less of the propensity to know their HIV status. Similarly, age, marriage and earnings in cash and in kind are unfavorable characteristics to testing for men. Moreover, religion (Catholic and Protestant) represents an important determinant for males testing and higher education and debilitated wealth status act favorably on the women´s testing decision. Assuming the factors that negatively influence testing, the prevention HIV strategic programs should be carefully designed towards the strengthening of the overall knowledge and importance of the HIV test in rural areas, and particularly orientated for elder individuals. Other target groups as no religious men or less educated women should be particularly achieved by the national campaigns promoting the routine test performance. In light of the findings of this project, is conclusive that the promotion of a universal ART coverage scheme would improve individual's willingness to test in the three countries. There is evidence of a positive relation between the antiretroviral treatment availability and demand for testing and consequently, the awareness of HIV status. Nevertheless, it is inconclusive if the impact is larger for female and male, since each ART related variable demonstrates the opposite predominant impact between genders. The constructed ART related variables were the best proxies to demonstrate the individual level of accessibility and availability of ART in a given country. More precise data on the availability of ART would enrich and refine this analysis. The individual eligibility for ART when a positive HIV status is found is established according the advanced stage of the HIV infection and the availability of a center or clinic for drug prescriptions. Drugs are still

expensive and scarce in most Sub-Saharan African countries. Finally, notwithstanding the need of improve the policies of routine test campaigns in the three countries, particular efforts to encourage men in Zimbabwe and women in Zambia to test should be made.

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Appendix

Table A: Total sample distribution by gender and country.

	Namibia	**Zambia**	**Zimbabwe**	Total
Men	3.915	6.500	7.175	17.590
Women	9.804	7.146	8.907	25.857
Total	13.719	13.646	16.082	43.447

Table B: Descriptive statistics by gender and country.[7]

	Men			**Women**		
	Namibia	Zambia	Zimbabwe	Namibia	Zambia	Zimbabwe
Age						
15-29	548 43,77%	685 46,28%	662 53,13%	1875 48,96%	887 55,89%	731 59,05%
30-44	595 47,52%	560 37,84%	445 35,71%	1673 43,68%	584 36,80%	433 34,98%
45-59	109 8,71%	235 15,88%	139 11,16%	282 7,36%	116 7,31%	74 5,98%
Education						
None	73 5,83%	44 2,97%	7 0,56%	187 4,88%	104 6,55%	22 1,78%
Primary	287 22,92%	511 34,53%	203 16,29%	847 22,11%	683 43,04%	249 20,11%
Secondary	732 58,47%	725 48,99%	878 70,47%	2399 62,64%	625 39,38%	874 70,60%
Higher	160 12,78%	200 13,51%	158 12,68%	397 10,37%	175 11,03%	93 7,51%

[7] Sample used in the empirical analyze. The existence of missing values causes in some countries a sum inferior to 100%.

Married						
No	695 55,51%	545 36,82%	519 41,65%	2187 57,10%	679 42,79%	558 45,07%
Yes	556 44,41%	935 63,18%	727 58,35%	1641 42,85%	908 57,21%	680 54,93%
Work						
No	214 17,09%	188 12,70%	240 19,26%	1371 35,80%	648 40,83%	617 49,84%
Yes	1038 82,91%	1292 87,30%	1004 80,58%	2459 64,20%	938 59,11%	621 50,16%
Residence Area						
Urban	725 57,91%	726 49,05%	637 51,12%	2128 55,56%	927 58,41%	637 51,46%
Rural	527 42,09%	754 50,95%	609 48,88%	1702 44,44%	660 41,59%	601 48,55%
N. observations						
	1.252	1.480	1.246	3.830	1.587	1.238

Table C: HIV/AIDS related questions.

		Have you ever heard about HIV/AIDS? "Yes"	**Have you ever been tested to see if you have the AIDS virus? "Yes"**	**Have you heard of drugs to help infected people to live longer? "Yes"**
Namibia	Men	3.873 98,93%	1.260 32,55%	1.101 11,67%
	Women	9.684 98,80%	5.265 54,41%	3.407 36,13%
Zambia	Men	6.467 99,49%	1.510 23,35%	1.451 15,39%
	Women	7.078 99,05%	2.906 40,67%	1.557 16,51%
Zimbabwe	Men	7.108 99,07%	1.259 17,71%	982 10,41%
	Women	8.691 97,57%	2.276 25,55%	933 9,89%

Last test performed was:		**Voluntary asked**	**Offered and accepted**	**Required**
Namibia	Men	939 74,52%	118 9,37%	203 16,11%
	Women	2.613 66,97%	930 23,83%	359 9,20%
Zambia	Men	1.083 71,82%	235 15,58%	190 12,60%

	Women	950 59,79%	396 24,92%	243 15,29%
Zimbabwe	Men	671 53,59%	354 28,27%	227 18,13%
	Women	805 35,45%	1.002 44,12%	464 20,43%

Table D: Sample size excluding the missing values of the dependent variable "Tested".

	Men	**Women**	**Total**
Total Sample size	17.590 100%	25.857 100%	43.447
Tested Last 12 months	2.114 12,02%	5.019 19,41%	7.133
Asked for the test	2.693 15,31%	4.368 16,89%	7.061
Known the result	3.635 20,67%	9.389 36,31%	13.024
Final Sample Size	3.978 22,62%	6.655 25,74%	10.633
Final Missing values	13.612 77,38%	19.202 74,26%	32.814

Table E: Determinants of the decision to get "Tested for HIV": logit regressions.

	Equation A (Marginal effects after logit)	
	Voluntary Tested and result known (Women=1)	Voluntary Tested and result known (Women=0)
Age (30/44)*	-.0873 (0.000)***	-.0466 (0.019)**
Age (45/59)*	-.1231 (0.000)***	-.0656 (0.013)**
Poor wealth*	.0809 (0.035)**	-.0281 (0.444)
Medium wealth*	.0675 (0.069)*	-.0032 (0.924)
Rich wealth*	.0351 (0.358)	.0286 (0.446)
Richest wealth*	-.0148 (0.721)	.0364 (0.379)
Religion Catholic*	.0789 (0.323)	.0842 (0.088)*
Religion Protestant*	.0703 (0.336)	.0753 (0.087)*
Religion Muslim*	(omitted)	-.0330 (0.850)
Religion other*	.0746 (0.371)	.0305 (0.517)
Rural area*	-.0492 (0.022)**	.0039 (0.866)
Primary education*	.0489 (0.276)	-.0107 (0.827)
Secondary education*	.0642 (0.138)	.0261 (0.589)
Higher education*	.1354 (0.008)***	-.0509 (0.316)
Married*	-.0537 (0.001)***	-.0466 (0.021)**
Work*	(omitted)	(omitted)

Earnings in cash*	-.0539 (0.021)**	.0028 (0.909)
Earnings in cash and in kind*	-.0555 (0.143)	-.0802 (0.018)**
Earnings in kind*	-.0046 (0.943)	-.0358 (0.604)
Knows someone who has or died with HIV: “Yes”*	.0533 (0.001)***	.0332 (0.057)*
ART coverage	.0019 (0.079)*	.0063 (0.000)***
GDPpc	-.00001 (0.650)	-.0001 (0.000)***
Number of observations	3944	3278
Pseudo R-squared	0.0254	0.0443

	Equation B (Marginal effects after logit)	
	Voluntary Tested and result known (Women=1)	Voluntary Tested and result known (Women=0)
Age (30/44)*	-.0901 (0.000)***	-.0458 (0.022)**
Age (45/59)*	-.1241 (0.000)***	-.0651 (0.014)**
Poor wealth*	.0763 (0.048)**	-.0269 (0.464)
Medium wealth*	.0769 (0.040)**	-.0024 (0.944)
Rich wealth*	.0383 (0.319)	.0270 (0.472)
Richest wealth*	-.0229 (0.582)	.0279 (0.501)
Religion Catholic*	.0839 (0.297)	.0834 (0.091)*
Religion Protestant*	.0655 (0.374)	.0728 (0.099)*
Religion Muslim*	(omitted)	-.0341 (0.845)
Religion other*	.0818 (0.331)	.0309 (0.512)
Rural area*	-.0403 (0.064)*	.0098 (0.675)
Primary education*	.0413 (0.358)	-.0090 (0.853)
Secondary education*	.0555 (0.202)	.0300 (0.534)
Higher education*	.125 (0.014)**	-.0456 (0.373)
Married*	-.0461 (0.005)***	-.0453 (0.025)**
Work*	(omitted)	(omitted)
Earnings in cash*	-.0524 (0.026)**	-.0020 (0.936)
Earnings in cash and in kind*	-.0517 (0.176)	-.0843 (0.013)**
Earnings in kind*	-.0132 (0.839)	-.0353 (0.610)
Knows someone who has or died with HIV: “Yes”*	.0458 (0.006)***	.0327 (0.061)*
Heard about HIVdrugs by region	.5848 (0.000)***	.2281 (0.038)**
Namibia*	.0101 (0.774)	.1560 (0.000)***
Zambia*	-.0981 (0.016)**	.1358 (0.001)***
Number of observations	3944	3278
Pseudo R-squared	0.0323	0.0453